

CITY OF CHULA VISTA
CLIMATE CHANGE WORKING GROUP
Final Recommendations Report
April 2008

Summary:

The Climate Change Working Group of the City of Chula Vista was tasked with identifying climate protection actions that provide the best opportunity for the City to meet, or make the most progress towards meeting its ICLEI/Kyoto commitment of reducing citywide greenhouse gas (GHG) emissions to 20% below 1990 levels. After reviewing over 90 climate protection actions implemented by other cities, the Climate Change Working Group has selected the following measures that it feels are most likely to reduce Chula Vista's greenhouse gas emissions in the next few years:

1	Require that 100% of the replacement vehicles purchased for the municipal fleet be high-efficiency (hybrid) or alternative fuel vehicles.
2	Encourage City-contracted fleet operators to adopt the use of high-efficiency (hybrid) or alternative fuel vehicles, by stipulating that 100% of replacement vehicle purchases should be alternative fuel or hybrid vehicles.
3	Require City of Chula Vista-licensed businesses to participate in an energy assessment of their physical premises every three years and upon change of ownership.
4	Adopt community-wide green building standards that are comprehensive in coverage and mandatory. New and substantially remodeled structures will be required to be built to LEED silver or to an equivalent 3rd party certification green building program, with the effect of having an energy efficiency impact of at least 20% over Title-24.
5	Facilitate widespread installation of solar photovoltaic (PV) systems on commercial, residential and municipal facilities by developing and implementing a solar energy conversion program. Proactively enforce existing codes requiring pre-plumbing for solar hot water.
6	Facilitate "Smart Growth" around the H Street, E Street and Palomar Street Trolley Stations
7	Coordinate with Otay Water District, San Diego County Water Authority and the Sweetwater Authority to convert turf lawns to xeriscape.

Background:

The Climate Change Working Group was convened in July 2007 under the direction of the Council's ICLEI representatives, Councilmember Castaneda and Councilmember McCann, who serve as the City's Climate Change Subcommittee. The Subcommittee and their staff took an active role in establishing the sectors to be represented in the Working Group, submitting participant names and reviewing all potential representatives. The Planning Department, General Services, Public Works and Community Development were also invited to participate. The final ten-member group included seven Chula Vista residents and three members who lived elsewhere, but were involved in the Chula Vista community. In addition, three ex-officio members with strong interests in Chula Vista's climate reduction actions supported the Working Group (see Appendix A for full participant list).

To help direct the Working Group in their task of identifying effective emissions reduction strategies, City staff provided the following five criteria to guide recommendations: 1) the measure had been previously implemented by an ICLEI local government or California Climate Action Registry business, 2) the measure would be financially feasible (i.e. require little or no additional General Fund support, 3) the measure could be quickly implemented to have immediate impact on the City's efforts to reduce emissions by 2010, 4) the measures' impacts could be quantified using the City's emissions inventory protocol and 5) the measure would not cause a significant adverse community impact. CCWG meetings were initially moderated by a professional City facilitator (Dawn Beintema), while Conservation and Environmental Services Department staff provided administrative support.

The Working Group process was divided into three sets of meetings. The first set was spent reviewing the City's 2005 GHG emissions inventory, learning about each of the sectors that generate emissions (energy, land use/transportation, waste and water) and investigating what actions other cities had taken to reduce emissions from each sector. These actions were compiled into a list of 90 measures (see Appendix E) which could then be evaluated by the five criteria listed above. In the second set of meetings the Group reviewed these lists, and selected the measures from each sector that had the most potential to reduce emissions significantly while still meeting the five criteria (the list was narrowed to approximately 20 recommendations). The final set of meetings was spent distilling the list down to seven recommendations, and collaboratively writing and editing the text explaining these recommendations.

In writing the recommendation text, the Climate Change Working Group strove to create implementation strategies that were neither overly specific and prescriptive, nor overly general. The Working Group's goal was to create recommendations detailed enough to lay the groundwork for speedy implementation, but also general enough to be adaptable

under changing circumstances. In the end, the Working Group's approach to the recommendation text was guided by its original charter, which was to create recommendations for Council but to leave the implementation details to staff specialists who are more familiar with municipal codes and processes.

Many broader climate reduction actions, such as recommendations to re-organize Chula Vista's land use and transportation systems to favor transit, are absent from this list. While large-scale, system-level changes of this nature are likely to be necessary for sustained GHG emissions reductions, the Group felt that these recommendations were often too complex to be implemented and measured in the short term. The Chula Vista Carbon Dioxide (CO₂) Reduction Plan (2000) contains an excellent list of broader policies that should guide the City in the 21st century as it seeks to reduce its "carbon footprint" (See Appendix C). The Climate Change Working Group would like to reiterate the importance of these broader policies, while at the same time acknowledging that the implementation of these policies is often outside of the City's purview.

The Climate Change Working Group's recommendations represent an important strategic opportunity for the City. Council has reiterated its commitments to reducing GHG emissions, yet if the City continues with a "business as usual" approach, emissions are sure to increase further. On the other hand, if the City follows the Working Group's recommendations (especially pertaining to Green Building standards and solar energy conversion), Chula Vista could begin to slow its community-wide increase in GHG emissions and eventually lead to reduced citywide emissions. Council is strongly encouraged to adopt the Climate Change Working Group's recommendations, and to speed their implementation into municipal code and practice.

Recommendation 1: Require that 100% of replacement vehicles purchased for municipal fleet be high efficiency (hybrid) or alternative fuel vehicles (AFVs).

The City of Chula Vista Climate Change Working Group recommends that City of Chula Vista require all replacement vehicles purchased for the municipal fleet be either high efficiency (hybrid) or alternative fuel vehicles (AFVs).

Background:

The City of Chula Vista Climate Change Working Group recommends that the City of Chula Vista expand its use of high efficiency fuel vehicles including electric, biodiesel, ethanol, hybrid, hydrogen and natural gas based on appropriateness for vehicle task, fueling infrastructure, petroleum displacement, overall cost and environmental benefit. Further, the Group recommends that the City develop policies to efficiently use the vehicles that it currently has, implementing concepts like “right sizing”, “trip chaining” and maintenance in order to derive the most benefit from each “vehicle miles traveled” (VMTs).

The City of Chula Vista has long been a pioneer in the use of high efficiency/alternative fuels. The City’s transit fleet and some light-duty vehicles run on compressed natural gas and the City has its own compressed natural gas fueling station and hydrogen fueling station. Many cities throughout California have also successfully adopted the use of high efficiency/alternative fuel vehicles from passenger cars to heavy-duty trucks. Additionally, the State of California has made the growth of the use of alternative fuels and alternative fuel vehicles a high priority and passed myriad legislation creating funding mechanisms to drive this growth. Alternative fuel vehicle options exist in most every class of vehicle in use by the City of Chula Vista, so it is recommended that the City consider all high-efficiency/alternative fuel appropriate options when considering all future vehicle acquisitions.

Recommended Performance Metrics for Measure:

Performance could be measured by setting aggressive goals for increasing the City’s use of alternative fuel vehicles (i.e. number of AFVs/high efficiency vehicles) and alternative fuels (i.e. gallons used), as well as development of associated fueling infrastructure. The effectiveness of the new measure could also be measured by tracking the average fleet “miles per gallon” (MPG) in gasoline, and setting ambitious goals to lower this MPG. Not only would this measure encourage greater adoption of AFVs, it would also focus the City on making the existing fleet as efficient as possible.

Fiscally Feasible:

The City can purchase high efficiency/alternative fuel vehicles as vehicle replacement funds become available. Substantial grant funding and incentives for light, medium and heavy duty alternative fuel vehicles are also currently available and expected to increase in years to come. Grant funding for fueling infrastructure may be available and private industry may also invest in necessary fueling infrastructure with local commitment to use. Because high-efficiency vehicles use less gasoline and alternative fuels are typically less expensive than conventional fuels, hybrid and AFVs can often recoup any additional upfront costs over their lifetime. Tax rebates on qualifying alternative fuels also exist, bringing their cost below that of petroleum-based fuels.

Short Timeframe:

Hybrid and alternative fuel vehicles can be implemented into the fleet immediately as vehicles are replaced, or new vehicles are purchased. Alternative fuel vehicle fueling infrastructure can be accomplished in 2008 and 2009.

Quantifiable Results:

The use of hybrid and alternative fuel vehicles will permit a reduction in the use of petroleum-based fuels. All targeted alternative technologies/fuels can have significant greenhouse gas emissions benefits over petroleum-based fuels such as gasoline and diesel.

Prior Execution:

Various cities including Burbank, Los Angeles, San Francisco and Vacaville, CA, as well as Boulder, CO.

No Adverse Effects:

While some alternative fuel vehicles may cost more than their gasoline and/or diesel counterparts, billions of dollars in current and future State and Federal incentives, grants and tax credits can bring the cost of those alternative fuel vehicles near or below that of a comparable gasoline or diesel-powered vehicle. In some cases, grant applications may need to be written and reports may need to be filed in the process of securing funding for vehicles and/or infrastructure; however, an increase in City staff would not be anticipated. Additionally, private industry may invest in necessary fueling infrastructure to meet the City's needs. Many alternative fuel vehicles currently offer significant fuel and maintenance cost savings over gasoline and diesel-powered vehicles.

Recommendation 2: Encourage City-contracted fleet operators to adopt the use of high efficiency (hybrid) or alternative fuel vehicles (AFVs), stipulating that 100% of replacement vehicle purchases be alternative fuel or hybrid vehicles.

The City of Chula Vista Climate Change Working Group recommends that the City of Chula Vista work with fleets under City authority and influence their expanded use of alternative fuels and alternative fuel vehicles (AFVs). All replacement vehicles purchased by City-contracted fleets should be either AFVs, high efficiency vehicles or vehicles otherwise able to demonstrate significant reductions in carbon emissions.

Background:

The City of Chula Vista Climate Change Working Group recommends that the City of Chula Vista work with fleets under City authority to influence their expanded use of alternative fuels and high-efficiency/alternative fuel vehicles including electric, biodiesel, ethanol, hybrid, hydrogen and natural gas based on appropriateness for vehicle task, fueling infrastructure, petroleum displacement, overall cost and environmental benefit.

While there are a number of fleets operating in the City of Chula Vista, few are under direct authority of the City with the exception of taxis and refuse trucks. There are currently over 200 taxis permitted by the Police Department to pick up passengers in the City of Chula Vista and over 50 refuse trucks authorized to collect household discards. There are currently hundreds of alternative fuel taxis and refuse trucks operating throughout California. Helping these fuel-intensive fleets adopt hybrid/alternative fuel vehicles should be the City's near-term priority. Additional fleet operators not directly under the City's authority that the City may be able to influence include United Parcel Services (UPS) (which uses alternative fuel vehicles at various hubs throughout the country), as well as other local manufacturers, distributors and service providers.

Recommended Performance Metrics for Measure:

Performance could be measured by setting aggressive goals for increasing fleet operators' use of high-efficiency/alternative fuel vehicles (i.e. number of hybrid and AFVs) and alternative fuels (i.e. gallons used), as well as associated fueling infrastructure.

Fiscally Feasible:

Fleet owners can purchase alternative fuel vehicles with existing vehicle replacement funds, ultimately meeting percentage targets set through contract negotiations.

Substantial grant funding and incentives for light, medium and heavy duty alternative fuel vehicles are also currently available and expected to increase in years to come. Grant funding for fueling stations may be available and private industry may also invest in necessary fueling infrastructure with local commitments to use. High-efficiency/alternative fuel vehicles often recoup their higher initial costs by life-cycle savings on fuel. Tax credits on qualifying alternative fuels also exist, bringing their cost below that of petroleum-based fuels.

Short Timeframe:

High-efficiency/alternative fuel vehicles can be implemented into fleets immediately with all scheduled vehicle replacements and/or new vehicle acquisitions. Alternative fuel vehicle fueling/charging infrastructure expansion can be accomplished in 2008 and 2009.

Quantifiable Results:

The conversion to high-efficiency/alternative fuel vehicles will reduce the use of petroleum-based fuels. All targeted alternative fuels have significant greenhouse gas emissions benefits over petroleum-based fuels such as gasoline and diesel.

Prior Execution:

Various cities and agencies in our neighboring South Coast Air Quality Management District, as well as Smithtown and Brookhaven, NY and San Antonio, TX.

No Adverse Effects:

While some high-efficiency/alternative fuel vehicles may cost more than their gasoline and/or diesel counterparts, billions of dollars in current and future State and Federal incentives, grants and tax credits can bring the cost of those alternative fuel vehicles near or below that of a comparable gasoline or diesel-powered vehicle. In some cases, grant applications may need to be written and reports may need to be filed in the process of securing funding for vehicles and/or infrastructure; however, an increase in staffing would not be anticipated and private industry partnerships are available to incur these costs on behalf of fleet owners. Additionally, private industry may invest in necessary fueling infrastructure to meet fleet owners' needs. Many alternative fuel vehicles currently offer significant fuel and maintenance cost savings over gasoline and diesel-powered vehicles.

Recommendation 3: Require City of Chula Vista-licensed businesses to participate in an energy assessment of their physical premises every three years and upon change of ownership.

The City of Chula Vista Climate Change Working Group recommends that City of Chula Vista-licensed businesses be required to participate in an energy assessment of their physical premises every three years and upon change of ownership.

Background:

The City of Chula Vista Climate Change Working Group recommends that City of Chula Vista-licensed businesses be required to participate in an energy assessment of their physical premises every three years as a way of helping businesses take advantage of rapidly evolving energy-efficiency practices and technologies. The City of San Diego has had a similar code in place since the early nineties requiring that all buildings receiving water service from the City of San Diego obtain a Water Conservation Plumbing Certificate upon change of ownership. This requirement has led to widespread installation of water-conserving equipment in the building stock. The City of Berkeley has a similar municipal code in place requiring businesses to complete an energy assessment upon change of ownership. This code has been shown to create a heightened awareness of energy conservation among citizens.

The proposed recommendation is based on the City of San Diego/ City of Berkeley codes and would require assessments for businesses every three years and upon change of ownership. The proposed code would integrate the assessments into the existing Business License Renewal Program, with assessments to be conducted by City staff with support from the SDG&E Partnership Program. Energy assessments would vary by business type, but would be designed for flexibility in order to help take advantage of available incentive and rebate opportunities. Because water use and energy consumption are directly linked, water-conserving practices and technologies would also be encouraged under this program.

Recommended Performance Metrics for Measure:

The implementation of this measure requires a change to the City's business licensing code stipulating the energy assessment requirement. Before the code could be written it would be necessary to establish who would perform the assessments (likely City staff supported by SDG&E), what standards were to be met and how the assessments would be integrated into the business licensing process. Once the code was in place, performance could be gauged by measuring the number of assessments completed.

Fiscally Feasible:

City staff currently conduct energy assessments as part of the SDG&E-City of Chula Vista Energy Efficiency Partnership Program. The required business assessments would be an outgrowth of that effort. In the last year, the City has completed approximately 400 business assessments. The City currently licenses approximately 3,500 businesses with physical premises, meaning that the assessment efforts would need to be stepped-up to assess an additional 700-800 businesses per year. This is not unmanageable under the existing program format, but would require efforts to be re-focused on business assessments rather than residential lighting exchanges.

Short Timeframe:

Increased business energy assessments could result almost immediately in energy conservation behaviors and efficiency improvements. Reduction in carbon emissions can reasonably be expected within a 2-3 year time frame.

Quantifiable Results:

Reductions in energy use are among the easiest measures to quantify in the City's GHG emissions inventory. Effective energy assessments that change business behaviors can be expected to yield quantifiable, albeit modest, GHG reductions.

Prior Execution:

Berkeley, CA, San Jose, CA, San Diego, CA (water assessment)

No Adverse Effects:

While requiring businesses to complete an energy assessment every three years would add an additional complication to the business licensing process, the benefit to businesses in cost savings through energy use reduction can be expected to overwhelm the hassle of completing the assessment. It is possible that the assessments would create additional complexity for the City's business licensing staff.

Relevant Links:

- 1) City of San Diego Plumbing Retrofit Ordinance:
<http://www.sandiego.gov/water/conservation/selling.shtml>
- 2) City of Berkeley Commercial Energy Conservation Ordinance
<http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=15474>

Recommendation 4: Adopt community-wide green building standards that are comprehensive in coverage and mandatory. New and substantially renovated structures will be required to be built to LEED silver or to an equivalent 3rd party certification green building program, with the effect of having an energy efficiency impact of at least 20% over Title-24.

The City of Chula Vista Climate Change Working Group recommends that City of Chula Vista adopt community-wide green building standards that are comprehensive in coverage and mandatory. Permits shall not be given to a building unless it is designed and built as LEED silver, or equivalent from another 3rd party certification green building program, with the effect of having an energy efficiency impact of at least 20% over Title-24. This requirement would then be regularly updated to meet Architecture 2030 goals of energy net zero construction by 2020 for homes and 2030 for businesses.

Background:

Energy use by existing building stock accounts for half of Chula Vista's community greenhouse gas emissions. The City's Climate Change Working Group recommends that the City take action to reduce emissions from buildings by changing the municipal code stipulations to require builders to exceed Title-24 standards. Requiring builders and building managers to meet higher energy efficiency standards would help support the long-term value of the City's building stock by encouraging upkeep and assuring the future reliability and comfort of structures.

Building energy efficiency standards are currently set by California Code of Regulations (CCR) Title 24.12. Though Title-24 energy standards are among the most rigorous energy codes in the U.S., buildings constructed to LEED (Leadership in Energy and Environmental Design) standards are at least 14% more efficient than buildings simply built to current Title-24 standards. Opportunities for energy savings are particularly great in the residential sector, where Title-24 requirements are comparatively less stringent. The Climate Change Working Group recommends that the City take advantage of this potentially tremendous energy savings by creating a municipal code requiring buildings to exceed Title-24 standards.

A variety of different approaches could be taken to mandate the construction of energy efficient structures within the City of Chula Vista. Requiring that builders construct green buildings, which are designed to maximize energy efficiency and sustainability, can be an effective way to exceed Title-24 requirements. The Working Group's recommendation both encourages the use of green building methods and focuses specifically on energy efficiency.

Furthermore, the Climate Change Working Group recommends the following guidelines for implementation of these recommendations as to properly capture the letter and spirit of the Working Group's findings:

1. Any energy code/green building measure must be required for both public and private development.
2. The requirements must be comprehensive in the size and types of structures covered.
3. The requirements should include participation in an already existing green building 3rd party certification program with an energy efficiency component.

If there is a phase-in period, it must be relatively short as to be relevant to the 2010 GHG emission deadline and must be connected to a clear and concise timetable for implementation.

Prior Execution:

While the Climate Change Working Group strongly recommends that the City enact codes to make both new and remodeled buildings more efficient, the logistics of creating a Green Building Code for Chula Vista require research time and effort beyond the scope of the Working Group. By approving this measure, Council will direct staff to research and develop an implementation plan for this recommendation.

Recommended Performance Metrics for Measure:

The implementation of this measure requires an addition to the City's municipal code outlining the new green building standard. Performance would be gauged by the number of building permits applied for, the number accepted, and the number of compliant buildings built.

Fiscally Feasible:

The City of Chula Vista currently has building code requirements that must be met before a building can be permitted. This recommendation would require a modest addition to these existing building standards. The new codes should be designed to work within pre-existing implementation and compliance mechanisms to allow for cost-effective enforcement. While additional training for existing staff may be required, it is not likely to impose significant additional costs upon the City.

Short Timeframe:

The implementation of these standards could occur as soon as municipal codes are amended and adequate notice is given to the public. The fact that the implementation and

enforcement process for building new structures is already in place shortens the recommendation's implementation

Quantifiable Results:

Reductions in energy use by buildings are among the easiest carbon-reducing actions to quantify. Credible sources ranging from the Department of Energy to the California Attorney General have endorsed green buildings standards as an effective means of reducing carbon emissions.

Prior Execution:

Mandatory green building standards have been adopted in Santa Barbara, Santa Cruz, Los Angeles, San Diego, West Hollywood, Santa Monica, Boston and Washington D.C. (to name a few). (Please see Appendix B)

No Adverse Effects:

While these standards require project applicants to meet additional requirements before they can be issued a building permit, the areas to be regulated by these green building codes are no different than other building requirements currently imposed on developers including structural, lighting, earthquake safety and ventilation requirements. Such standards have proven to have little, if any, adverse effects on the number of permits sought. Studies by the California Public Utilities Commission (CPUC) have shown that building to basic "LEED certification" can be done at virtually no extra cost. The fact that the proposed standards allow developers the flexibility and autonomy to determine how best to meet these requirements will offset the burden associated with meeting an additional procedural requirement. This recommendation is consistent with the CPUC and California Energy Commission's stated goal to make new residential and commercial buildings "carbon-neutral" by 2020 and 2030, respectively. In addition, such a requirement will reduce the future growth in peak demand for electricity thus reducing the future need for the South Bay Power Plant.

Relevant Links:

1. Boston Green Building Program:
<http://www.cityofboston.gov/bra/gbtf/GBTfHome.asp>
2. Santa Monica Municipal Code:
http://www.qcode.us/codes/santamonica/index.php?topic=8-8_108-8_108_060
3. Los Angeles Bar Association Review of California Municipal Green Building Codes:
<http://www.lacba.org/showpage.cfm?pageid=8922>

4. Santa Barbara Green Building Code

[http://www.santabarbaraca.gov/Documents/Sustainable_Santa_Barbara/In_the_News/01_Press_Releases/2007-10-](http://www.santabarbaraca.gov/Documents/Sustainable_Santa_Barbara/In_the_News/01_Press_Releases/2007-10-29_Santa_Barbara_Energy_Ordinance_Beats_California_Building_Code.pdf)

[29_Santa_Barbara_Energy_Ordinance_Beats_California_Building_Code.pdf](http://www.santabarbaraca.gov/Documents/Sustainable_Santa_Barbara/In_the_News/01_Press_Releases/2007-10-29_Santa_Barbara_Energy_Ordinance_Beats_California_Building_Code.pdf)

5. San Francisco Green Building Codes

http://www.sfenvironment.org/our_programs/topics.html?ssi=0&ti=19

Please see Appendix B for further links to municipal green building programs.

Recommendation 5: Facilitate widespread installation of solar photovoltaic (PV) systems on commercial, residential and municipal facilities by developing and implementing a solar energy conversion program. Proactively enforce existing codes requiring pre-plumbing for solar hot water.

The City of Chula Vista Climate Change Working Group recommends that the City of Chula Vista facilitate widespread installation of solar photovoltaic (PV) systems on commercial, residential and municipal facilities by developing and implementing a solar energy conversion program. The Group also recommends that the City more proactively enforce existing codes requiring pre-plumbing for solar hot water.

Background:

Developing cleaner energy sources is an essential tool for slowing climate change. Solar energy remains a largely untapped resource for generating clean energy. According to the U.S. Environmental Protection Agency (EPA):

- Each day more solar energy hits the Earth than its inhabitants could consume in 27 years.
- Solar energy technologies produce minor amounts of greenhouse gases, generated mostly during the manufacturing process.
- A 100-megawatt solar thermal electric power plant, over 20 years, will avoid more than 3 million tons of carbon dioxide emissions when compared to the cleanest conventional fossil fuel-powered electric plants.

Photovoltaic (PV) solar panels convert sunlight directly into electricity. PV panels can be mounted to commercial, residential and municipal buildings and connected directly to the energy grid. For residential applications, annual audits by the energy company provide a comparison between the energy contributed from the solar system to the amount of energy used. If there is a shortfall, the user then pays for the difference. Energy conservation is also an important part of an efficient solar system.

Financing Options

The primary barrier to the installation of solar PV systems is cost. The average 2 kilowatt (kW) solar system can cost between \$16,000-\$26,000 to install. The payback period for a solar system can be anywhere from 15-30 years, depending on location, type of panels used, maintenance and weather. Options for overcoming this barrier include:

1) Power Purchase Agreement (PPA): In a PPA, a property owner allows a solar energy contractor to install and operate PV solar panels on their property. Though energy produced by the panels is used on-site, the property owner continues to pay their electric bills, this time to the solar installer rather than the utility company. Once the cost of the solar installation has been paid back, the property owner generally has the option of

taking over the ownership/operation of the solar panels. This type of solar agreement is most often used on large structures such as schools, municipal facilities and retail stores.

Application: This type of solar financing would be most practical for City facilities with large roof areas, such as parking garages.

Implementation: The City could require a certain percentage of its municipal energy to be generated on-site with solar PV panels. PPAs are a tool which could be used to help the City reach this solar goal, especially if the City was not able to afford Solar through other means.

2) City Solar Financing/Special Assessment: The City of Berkeley is helping residents afford solar by paying up-front for the cost and installation of residential solar systems, and then recouping the cost by assessing an additional tax on participating properties which would pay back the cost of the system over a 20 year period. Residents benefit immediately from reductions on their energy bills. The City of Berkeley won a \$200,000 solar grant from the EPA to help cover the start-up costs for the program.

Application: This type of solar financing would help surmount the costs of solar system installation for individual homeowners. By helping spread the cost of the solar system across a 20 year period, residents are able to experience the solar system payback more immediately.

Implementation: The City could establish a program like the one in Berkeley, giving Chula Vista property owners the option to install City-financed solar systems on their buildings. These systems would then be paid off over a set timeframe through special property assessments.

3) Community Solar Program and Trust Fund: The City of Santa Monica's comprehensive solar program helps lower the cost of solar by simplifying the permitting process for solar construction, identifying solar contractors who are willing to do installations at a reduced "Santa Monica" rate, identifying banks/lenders to help residents finance solar installation costs and by providing free energy assessments to residents. Energy assessments help residents reduce their energy consumption through conservation first, thereby reducing the size of the solar system they will eventually install. For residents who rent their homes, or have a site that is not suitable for the installation of solar panels, the City offers the option of buying shares in a Community Solar System Fund. This fund helps buy down the cost of solar installation for the City overall.

Application: This tool could be used to create funds for the general establishment of solar programs, to buy down the cost of solar installation in the City and to expedite the processing of solar permits.

Implementation: The City could establish a solar program modeled on "Solar Santa Monica," with an option that allows residents to buy into the "Solar Trust Fund."

Determining the appropriate combination of financing options and program designs for the City would require research and policymaking beyond the scope of the Climate

Change Working Group. The group does recommend that the City hasten to adopt a solar energy conversion plan that incorporates the strategies listed above. At the same time, there are a variety of less elaborate actions that the City can take to ensure the adoption of solar technologies:

Pre-Plumb/ Pre-Wire for Solar

Since 1982 the City has had a code in place requiring pre-plumbing for solar hot water on new homes. Though this code has been in place since the early '80s, it has received little to no enforcement. The Climate Change Working Group recommends that the City enforce this code requirement going forward. Furthermore, the Group recommends that this code be amended to require that new homes are also pre-wired for solar PV. Pre-plumbing and pre-wiring for solar reduces barriers to the installation of these technologies, and ensures that conventional homes can be easily converted to alternative energy sources as funds become available.

Require Solar Installation as an “Upgrade Option” on New Homes:

Some homebuilders (ex. Pardee Homes) offer solar PV systems as an “upgrade” option on new homes. However, this option is not offered by any developers in the City of Chula Vista at this time. The Climate Change Working Group recommends that the City require new home developers in Chula Vista to offer solar PV systems as an “upgrade” option.

Provide Residents Free Home Energy Assessments:

Home energy efficiency can reduce the cost to make homes “net zero energy” by reducing the size of the solar system needed to offset energy use. Any solar PV program should be complemented by energy conservation programming. The City’s Conservation and Environmental Services Department currently offers home energy assessments as part of the City’s partnership with SDG&E. The Group recommends that the City continue to provide these assessments going forward.

Recommended Performance Metrics for Measure:

Performance can be measured by the number of commercial, residential and municipal facilities installing solar PV systems each year. Performance can also be measured by the number of megawatts produced by program-installed PV systems. Citywide clean energy generation goals could be established (ex: 100 megawatts of solar generation by 2012).

Fiscally Feasible:

In addition to the financing mechanisms mentioned above, a variety of federal, state and non-profit funds for solar programs are available. In addition to receiving a \$160,000 “Solar America” grant from the EPA for the administrative costs of establishing a solar

program, Berkeley also received a \$75,000 grant from its regional Air Quality Management District. The Berkeley Program also benefits from the California Solar Initiative rebate, which is applied to the total cost Berkeley pays for the solar systems. Solar systems installed on municipal facilities can take advantage of a similar State and Federal incentives. Because the amount of these incentives and rebates is designed to decrease over time, the Climate Change Working Group recommends that the City work to take advantage of these financing opportunities while they are still significant.

Short Timeframe:

If aggressively pursued, a basic program could be put in place in 12 to 18 months. Developing a more elaborate program with financing for residential solar installation would be more within the 2 to 4 year timeframe.

Quantifiable Results:

Widespread solar energy conversion in the City of Chula Vista would help shift energy production away from greenhouse gas producing power plants. (See the discussion of performance metrics above).

Prior Execution:

City of Santa Monica “Solar Santa Monica” program, City of San Francisco “Climate Action Plan”.

No Adverse Effects:

Facilitating solar energy conversions would not cause adverse economic or social impacts or shift negative environmental impacts to another sector. Creating a robust solar energy conversion program would encourage economic development and create opportunities for the struggling housing construction industry.

Relevant Links:

1. U.S. EPA Fact Sheet: Climate Change Technologies, Solar Energy
[http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BVR3A/\\$File/solarenergy.pdf](http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BVR3A/$File/solarenergy.pdf)
2. Solar Santa Monica
<http://www.solarsantamonica.com/main/index.html>
3. The GfK Roper Yale Survey on Environmental Issues
<http://environment.yale.edu/documents/downloads/h-n/LocalActionReport.pdf>
4. San Francisco Solar Plan Press Release

http://www.sfgov.org/site/assessor_page.asp?id=72332

5. City of Berkeley Solar Plan Press Release

<http://www.ci.berkeley.ca.us/Mayor/PR/pressrelease2007-1023.html>

Recommendation 6: Facilitate "Smart Growth" around the H Street, E Street and Palomar Street Trolley Stations.

The City of Chula Vista Climate Change Working Group recommends that City of Chula Vista facilitate smart growth around the H Street, E Street and Palomar Street Trolley Stations.

Background:

Chula Vista's trolley stations offer a unique smart growth opportunity. Smart growth is a compact, efficient and environmentally sensitive pattern of development that provides people with additional travel, housing and employment choices by focusing future growth away from rural areas and closer to existing and planned job centers and public facilities. Smart growth reduces dependence on the automobile for travel needs. Automobile travel reductions prevent the burning of fossil fuels that contribute to greenhouse gases and climate change.

The E Street and H Street trolley stations are defined as "Primary Gateways" within the Promenade Vision Area in the City of Chula Vista Urban Core Specific Plan. The vision description is as follows.

"A dynamic mix of regional transit centers, visitor serving uses and a retail complex surrounds an enhanced, medium-rise residential quarter. Circulation is improved by re-establishing the traditional street grid. A tree-lined, extended linear park offers both neighborhood and community serving amenities supported by mid-block paseos. The park transitions from an active community venue with a more formal landscape to recreational features such as tennis and basketball courts to passive greens. Anchoring the park, the retail plaza links the Bayfront to the regional mall. Ample public spaces provide for open air markets, mercados, cultural festivals, art exhibits and other community events."

The Palomar Station is already zoned as a "Gateway Transit District" under the current zoning plan, with densities up to 40 dwelling units per acre permissible by code.

Recommended Performance Metrics for Measure:

Performance could be measured by the number of building permits issued within one-quarter mile of the trolley stations.

Fiscally Feasible:

Yes.

Short Timeframe:

If aggressively pursued, new building permits could be issued in 18 to 24 months.

Quantifiable Results:

Possible. Reduction of greenhouse gas emissions could be quantified by developing an estimated emission value per square foot of smart growth residential space and an estimated emission value per square foot of more traditional suburban residential space. The difference between the two could be used to calculate the emissions reduction due to new residential smart growth around the trolley stations.

Prior Execution:

“New Places, New Choices: Transit-Oriented Development in the San Francisco Bay Area, November 2006” www.mtc.ca.gov/library/TOD/index.htm, transitvillages.org, transitorienteddevelopment.org.

No Adverse Effects:

A difficult topic to address with any smart growth project is traffic impact. This issue would be easier to address if a trolley station were made an integral part of the smart growth project. Interstate 5 and a robust grid network of local streets are also in close proximity to the E Street, H Street and Palomar Street Trolley Stations. Implementing smart growth around trolley stations would potentially cause adverse economic or social impacts and potentially shift negative environmental impacts to another sector.

Recommendation 7: Coordinate with Otay Water District, San Diego County Water Authority and the Sweetwater Authority to convert turf lawns to xeriscape.

The City of Chula Vista Climate Change Working Group recommends that City of Chula Vista coordinate with Otay Water District, San Diego County Water Authority and the Sweetwater Authority on turf lawn conversions for commercial and residential properties. Pumping water is a significant contributor to GHG emissions in California. Converting lawns to water-wise gardens and/or artificial turf has been shown to reduce outdoor residential water use by 40%, thereby reducing emissions from this sector.

Background:

The pumping of water and wastewater in California is estimated to take up at least seven percent of the State's total energy usage, making water use a significant contributor to the State's overall CO₂ emissions. (2007 PIER Report). According to the San Diego County Water Authority, up to fifty percent of household water use goes to thirsty turf grass lawns. The Climate Change Working Group recommends that the City support and coordinate with existing programs aimed at reducing the amount of water used in landscaping.

The Otay Water District's "Cash for Plants" program pays residents and businesses up to \$2,200 to convert turf lawns or other high water-use plants to drought-tolerant plants. This type of landscaping is often called "xeriscaping" and utilizes San Diego native and California-friendly plants. However, the program is restricted to turf grass lawns larger than 750 square feet. This restriction prevents many smaller residential and commercial properties from participating in the program. Otay Water District has recently begun a second program that pays single-family homeowners to replace their lawns with artificial turf, with a \$1/sf incentive. This program only applies to lawns smaller than 1,000 SF, though it supplements programs that pay schools to convert their fields to artificial turf.

Ideally, the Climate Change Working Group would like to see the City develop its own program to supplement the rebates offered by the local water districts, and to extend the programs to parts of the City under the jurisdiction of the Sweetwater Authority which currently doesn't offer the programs.

If developing an independent incentive program is not fiscally possible, the Climate Change Working Group encourages the City to work with Otay Water District to help promote its program to all residents and businesses. The City could help by integrating the information into existing community outreach activities, thereby increasing the numbers of Chula Vista lawns converted to xeriscapes. The City could also help residents overcome Home Owner Association rules and other logistical barriers to

xeriscape conversion. Additionally, the City might act as a facilitator helping to aggregate participating homes to buy-down the cost of contractor efforts.

Recommended Performance Metrics for Measure:

Effective implementation of this measure could be gauged by comparing current numbers of existing turf-to-xeriscape incentive applications with the numbers of applications 2 or 3 years into the future, with the expectation that the City's efforts would result in an increase in applications.

Fiscally Feasible:

The recommendation's fiscal impact would vary depending on the degree (and type) of support the City provided. At present, the City has a nature-friendly gardening program (*Naturescape*) that encourages residents to adopt water-saving gardening practices. This program could be easily adapted to put an even greater focus on turf-to-xeriscape conversion programs. The *Naturescape* program is expected to end in June 2008, however, primarily due to lack of funding. The City could re-instate this program with potential financial support from the local water districts.

Short Timeframe:

Because the City has funding in place for the *Naturescape* program until June 2008, support and promotion of Otay Water District's "Cash For Plants" program could begin at once. It is expected that increased promotion would lead to an accelerated pace of landscape conversion in the next 2-3 years.

Quantifiable Results:

A study from the Southern Nevada Water Authority shows a net average residential water use savings of 30% for homes that have converted turf to xeriscape. Large scale implementation of the Water Authority "Cash For Plants" Program would likely have an impact on GHG emissions from water use, though the overall effect on the City's GHG emissions would be relatively small.

Prior Execution:

Similar programs have been implemented with success in Albuquerque, New Mexico, Mesa, Arizona and Cathedral City, California.

No Adverse Effects:

While some studies show that well-watered turf lawns function as a carbon sink in some areas, we can reasonably assume that the CO₂ cost of importing water, maintaining the lawns (requiring gas-powered mowers and travel by landscaping crews) and then managing runoff outweigh any carbon sequestration benefits the turf might have in Chula Vista.

Relevant Links

1. Otay Water District Flyer promoting Xeriscape Conversion Incentives: <http://www.otaywater.gov/owd/pages/waterconservation/Cash%20for%20plants.pdf>
2. Southern Nevada Water Authority Study on residential water savings from xeriscape conversion: http://www.snwa.com/assets/pdf/xeri_study_table.pdf

Appendix A: Climate Change Working Group Members List

NAME	ORGANIZATION	SECTOR	ALTERNATE
Lynda Gilgun	Resource Conservation Commission	Resident/RCC	
Alan Ridley	Cuyamaca College	Resident/Energy	
Chris Schodowski	Leviton Manufacturing Inc.	Resident/Business	
Erin Pitts	South Bay YMCA/Earth Service Corps	Youth	
Leo Miras	Environmental Health Coalition	Environmental	Laura Hunter
Cesar Rios	ECM Networks	Energy	
Alma Aguilar	Southwestern College	Youth/Environmental	
Hector Reyes	Reyes Architects	Resident/Architect	
Richard Chavez	SANDAG	Resident/Transportation	
Derek Turbide	Clean Energy	Resident/Transportation	
Brian Holland	SANDAG	Ex Officio	
Risa Baron	SDG&E	Ex Officio	Julie Ricks
Andrea Cook	CA Center for Sustainable Energy	Ex Officio	
Michael Meacham	CV Conservation& Environmental Serv.	Staff	
Brendan Reed	CV Conservation& Environmental Serv.	Staff	
Carla Blackmar	CV Conservation& Environmental Serv.	Staff	
Richard Hopkins	CV Public Works Operations	Staff	
Marisa Lundstedt	CV Planning & Building	Staff	Josie McNeeley
Lynn France	CV General Services	Staff	Manuel Medrano
Denny Stone	CV - National Energy Center for Sustainable Communities	Staff	

Appendix B: Municipal Green Building Standards Summary

MANDATORY RESIDENTIAL STANDARDS AND ORDINANCES

Boulder, CO- created their own point-based system for ALL residential development within the city. The bigger the project, the more points they must acquire. The system is essentially based on LEED criteria. It should be noted that one of the largest categories in which to get possible points is focused completely around solar- solar energy, passive solar, solar hot water, etc. http://www.bouldercolorado.gov/index.php?option=com_content&task=view&id=208&Itemid=489

West Hollywood, CA- also created a custom-made point-based system. Requires new residential development with three or more units to submit a green building plan and meet a minimum number of points. All covered projects must be solar-ready. <http://www.weho.org/index.cfm/fuseaction/DetailGroup/navid/53/cid/4493/>

Santa Cruz, CA- all new residential development are required to obtain a certain number of points from GreenPoint. <http://www.ci.santa-cruz.ca.us/pl/building/green.html>

Marin County, CA- all new residential development in unincorporated sections of the county are required to achieve a certain number of GreenPoint points. All single family dwellings larger than 3,500 sq. ft. are subject to the energy efficiency budget of a 3,500 sq. ft. building. <http://www.co.marin.ca.us/depts/CD/main/comdev/advance/Sustainability.cfm>

Santa Barbara, CA- The ordinance mandates building regulations, based on Architecture 2030 principles, which exceed Title 24 requirements by 20 percent for low-rise residential buildings, 15 percent for high-rise residential buildings and 10 percent for nonresidential buildings, among other measures. <http://sbdailysound.blogspot.com/2007/10/santa-barbara-boosts-green-building.html>

Chicago, IL- requires all residential development to meet energy requirements more stringent than the IL state standard.

Palm Desert, CA- requires all new residential development less than 4000 sq. ft. to meet energy requirements 10% beyond Title 24, and residential development greater than 4000 sq. ft. to meet energy requirement 15% beyond Title 24.

Santa Monica, CA- requires all new multi-family homes to meet a series of energy efficiency requirements that are 15% above Title 24. <http://www.greenbuildings.santa-monica.org/whatsnew/green-building-ordinance/green-building-Ord-1-5-2002.pdf>

Austin, TX- recently began adopting a series of building code requirements designed to create net zero energy homes. These are related to duct system leakage, HVAC sizing calculations, new lighting requirements, and building thermal envelope testing. http://action.nwf.org/ct/C1_aQw51IaZd/

MANDATORY COMMERCIAL STANDARDS AND ORDINANCES

West Hollywood, CA- requires all new commercial development to meet a certain number of points within their custom-made point system.

Chicago, IL- requires all commercial development to meet energy code requirements that are more stringent than the IL energy conservation code.

Santa Monica, CA- requires all new commercial development to meet energy code requirements that are 15% above Title 24 requirements.

Washington, DC- requires LEED certification or LEED silver (depending on the project type) for commercial development above 50,000 sq. ft. http://action.nwf.org/ct/Cd_aQw51IaZc/

Boston, MA- requires LEED certification for commercial development above 50,000 sq. ft. <http://www.bostongreenbuilding.org/>

Seattle, WA- required all commercial development to meet energy code requirements that are 20% above American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) standards. http://www.seattle.gov/DPD/stellent/groups/pan/@pan/@codes/@energycode/documents/web_informational/2006SECsummary.pdf

Santa Barbara, CA- The ordinance mandates building regulations, based on Architecture 2030 principles, which exceed Title 24 requirements by 20 percent for low-rise residential buildings, 15 percent for high-rise residential buildings and 10 percent for nonresidential buildings, among other measures. <http://sbdailysound.blogspot.com/2007/10/santa-barbara-boosts-green-building.html>

Appendix C: Recommendations from 2000 **CO2 Reduction Plan**

Table 6.3
ACTION MEASURES

1. *Municipal clean-fuel vehicle purchases.*
2. *Green Power (Replaced "Private Fleet Clean Fuel Vehicle Purchases" 6/98)*
3. *Municipal Clean Fuel Demonstration Project*
4. *Telecommuting and Telecenters*
5. *Municipal Building Upgrades and Trip Reduction*
6. *Enhanced Pedestrian Connections To Transit*
7. *Increased Housing Density Near Transit*
8. *Site Design with Transit Orientation*
9. *Increased Land Use Mix*
10. *Green Power Public Education Program (Replaced "Reduced Commercial Parking Requirements" 6/98)*
11. *Site Design with Pedestrian/Bicycle Orientation*
12. *Bicycle Integration with Transit and Employment*
13. *Bicycle Lanes, Paths and Routes*
14. *Energy Efficient Landscaping*
15. *Solar Pool Heating*
16. *Traffic Signal and System Upgrades*
17. *Student Transit Subsidy*
18. *Energy Efficient Building Recognition Program*
19. *Municipal Life-Cycle Purchasing Standards*
20. *Increased Employment Density Near Transit*

Appendix D: Refuting the Denialists from the San Diego Union-Tribune

CLIMATE CHANGE

Refuting denialists: an inconvenient truth

By Richard C. J. Somerville □ July 12, 2006

As a climate scientist, I am often asked, “Do you believe in global warming?” Climate change, however, is not a matter of personal belief.

Instead, among experts, it's just settled science that people are changing the climate. The Intergovernmental Panel on Climate Change, or IPCC, reported in 2001 that, “There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities.”

Every reputable scientific organization that has studied the IPCC conclusion has endorsed it. Recent research (<http://realclimate.org>) reinforces this assessment. The next major IPCC report, due in 2007, is likely to cite more supporting evidence.

Al Gore's film and book, “An Inconvenient Truth,” do a fine job of summarizing the science. You may agree or disagree with Gore politically, but nobody can deny that he has maintained a serious interest in climate change for some two decades and has become quite knowledgeable about it.

For San Diegans, it's a fascinating bit of history that Gore first learned about this issue as a Harvard student in the 1960s. His teacher was our own Roger Revelle. Before moving to Harvard, Revelle had been director of Scripps Institution of Oceanography and a founder of the University of California San Diego.

The Earth as a whole is always in approximate energy balance, absorbing energy from sunlight and emitting an equivalent amount of energy to space as infrared radiation.

Some infrared energy is emitted directly from the surface of the Earth. The rest is emitted from the atmosphere, by clouds and particles and the gases (chiefly water vapor and carbon dioxide) that contribute to the greenhouse effect.

Incidentally, we know that the amount of carbon dioxide in the atmosphere has increased substantially in recent decades, because this increase has been measured very accurately. The measurements were initiated by Charles David Keeling (1928-2005) whom Revelle brought to Scripps Institution of Oceanography in the 1950s. Keeling, who spent his entire career at Scripps, discovered that human activities are changing the chemical composition of the global atmosphere.

Carbon dioxide is produced by burning fossil fuels. Adding carbon dioxide to the atmosphere means that more of the energy emitted to space must come from higher (hence colder) levels of the atmosphere. The Earth will respond to this new situation by warming up, thus emitting more infrared energy, until the equilibrium is restored.

That's our fundamental scientific understanding. It comes from rock-solid, well-understood physics. Everything else, from heat waves to hurricanes, is fascinating and important, but that is really just the details, scientifically speaking.

Working out all the details will take a long time. But a promising start has been made, and climate science can already usefully inform policy.

In a similar way, you might say that an ultimate goal of medical science is to eliminate all disease. That this task is incomplete is no reason to treat your physician with disdain.

A group of people dispute the scientific consensus. They like to call themselves skeptics. A healthy skepticism, however, is part of being a good scientist, so I am unwilling to surrender this label to them. Instead, I call them denialists.

You don't get anything like a balanced view from climate denialists. Their only goal is finding ways why the climate might be resistant to human activities. By and large, these denialists have convinced very few knowledgeable scientists to agree with them.

Experience shows that in science, it tends to be the exception rather than the rule when a lone genius eventually prevails over conventional wisdom. An occasional Galileo does come along, but not often, and nearly all the people who think they are a Galileo are actually just wrong.

Science is very much a cooperative process and is largely self-correcting. We publish our research methods and our findings in detail and invite other scientists to confirm or disprove them. Incorrect science ultimately gets rooted out and rejected.

What of the future? I can imagine both an optimistic and a pessimistic scenario.

In my optimistic scenario, climate science informs the making of wise public policy. Technological creativity then leads to rapid development of practical energy alternatives to fossil fuels. We stabilize the Earth's greenhouse effect before it gets too strong.

My pessimistic scenario is a different planet, with sea level much higher and dangerously altered weather patterns. You cannot fool nature. Climate science warns us that strengthening the greenhouse effect must eventually produce serious consequences.

That's not radical environmental alarmism. It's physics. For me, the issue then becomes one of guessing whether we get wise before that day, or whether we must wait for some shocking and unpleasant climate surprise that wakes us all up.

For my children's sake, I hope that the optimistic scenario is the one that develops. The choice is ours to make.

Somerville is distinguished professor at Scripps Institution of Oceanography.

**Appendix E: Full List of Climate Protection Actions Reviewed by the Climate
Change Working Group**